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Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, VA 24143-0100
USA

May 21, 2004

Mr. Robert Thomson
U. S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

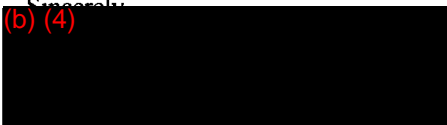
Subject: NRU Additional Characterization Sampling: Work Instructions, Final 2004
Radford Army Ammunition Plant
EPA ID# VA1 210020730

Dear Mr. Thomson:

Enclosed is one certified copy of NRU Additional Characterization Sampling: Work Instructions, Final 2004 Radford Army Ammunition Plant for your review and comment or approval. Your additional three copies will be sent under separate cover as well as additional copies to the Virginia Department of Environmental Quality (VDEQ), U.S. Army Environmental Center, U.S. Army Center for Health Promotion and Preventive Medicine. Attached are our responses to your comments dated April 21, 2004 and VDEQ comments dated March 25, 2004.

Please coordinate with and provide any questions or comments to myself at (540) 639-8266, Jerry Redder of my staff (540) 639-7536 or Jim McKenna, ACO Staff (540) 639-8641.

Sincerely,
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Alliant Ammunition and Powder Company LLC

Enclosure

c:

w/o enclosure

Russell Fish, P.E., EPA Region III, 3WC23

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Concerning the following:

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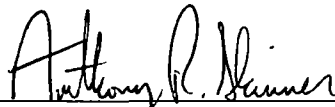
NRU Additional Characterization Sampling: Work Instructions, Final 2004

April 2004

Radford Army Ammunition Plant

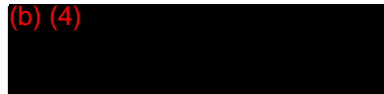
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE:
PRINTED NAME:
TITLE:



Anthony R. Skinner
LTC, CM, Commanding
Radford AAP

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PRINTED NAME:
TITLE:

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Vice President Operations
Alliant Ammunition and Powder Company, LLC

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Response to USEPA Comments dated 21 April 2004
for
Draft NRU Additional Characterization Sampling Work Plan
Dated November 2003

General Comments

EPA Comment 1

Some of the comparisons required by the screening procedure of the Site Screening Process (SSP) for the Radford Army Ammunition Plant (RFAAP [October 26, 2001]) were not conducted. These include the EPA Region 3 soil screening levels (SSLs) and the EPA Region 3 Biological and Technical Assistance Group (BTAG) Ecological Risk Assessment guidelines. Please revise the Work Instructions to compare all the available data to the SSLs and EPA Region 3 BTAG values and revise any conclusion drawn from the current comparisons accordingly. In addition, please clarify if the screening concentrations for non-carcinogens were adjusted to a hazard index (HI) of 0.1, as required, and if not, revise the Work Instructions to use a HI equal to 0.1 for non-carcinogens.

RFAAP Response

This document is not intended to be a complete, stand-alone document. The purpose of the Work Instructions is to provide notice as to additional delineation samples that will be collected as the result of the field investigation for WPA 012 conducted in June 2002. It is appropriate to use industrial, residential RBCs and background concentrations to determine hotspots in need of further delineation. A RI Report will be prepared that will screen data from previous investigations, the WPA 012 field investigation and the currently proposed investigation. The RI report will include a Human Health Risk Assessment (HHRA) and a Screening Level Ecological Risk Assessment (SLERA). At the completion of 2002 WPA 012 activities, data gaps in the extent of contamination at these sites lead to the preparation of these Work Instructions. RFAAP believes that it was inappropriate to complete the risk assessments without the additional delineation included in this document.

RBCs for non-carcinogens have been adjusted to an HI of 0.1. A full explanation of the screening values will be included in the follow up RI report at the conclusion of the proposed sampling.

EPA Comment 2

The Work Instructions figures contain comparisons to "background criteria." However, these background criteria are not listed or properly referenced in the Work Instructions. It is understood that the criteria used are contained in the RFAAP Facility-Wide Background Study Report (December 2001), but, for the benefit of the reviewer and, more importantly, the public, please revise the Work Instructions to include a table listing the site background values.

RFAAP Response

As stated above, the Work Instructions are not intended to be a complete, stand alone document. However, a table and reference to the FWBSR will be added to the report.

EPA Comment 3

The Work Instructions state that x-ray fluorescence (XRF) will be used to screen the soil samples collected in the Northern Burning Ground (NBG) main area and Western Burning Ground (WBG) for lead at a resolution of 20 milligrams per kilogram (mg/kg). The Work Instructions do not provide a reference for (or include) the quality assurance project plan (QAPP) and the Standard Operating Procedures (SOP) for the XRF lead screening. Please provide a reference for (or include) the XRF lead screening QAPP, and SOP within the Work Instructions.

RFAAP Response

An SOP for XRF will be added to the appendix for these Work Instructions. The data is intended to be used solely to guide the placement of confirmation samples. Data from the XRF screening will not be used for risk assessments in the RI Report.

EPA Comment 4

For each area of investigation, the proposed sampling locations do not address all of the areas that previous sampling results indicate detections and in many cases exceedances of various screening criteria. It is not clear how the vertical and horizontal extent of contamination at those areas outside the grid area locations proposed will be determined. Please revise the Work Instructions to discuss how and when the extent of contamination in these areas will be determined.

RFAAP Response

These Work Instructions will supplement the data collected for WPA 012. The sampling strategy is meant to complete delineation of elevated concentrations detected during field sampling in 2002. The issues raised in this comment will be addressed in the RI report.

Specific Comments**EPA Comment 5**

Section 1.1.2, Summary of Previous Investigations, page 1-3: The second paragraph in this section states that “volatile organic compounds (VOCs), non-polynuclear aromatic hydrocarbons (PAH), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), herbicides, explosive compounds, and metals are not a concern within the study area.” Metals were detected in the pre-RI removal action conducted at the Building Debris Disposal Trench (BDDT) area sampling, and were also detected in the 2002 delta and unnamed creek samples above screening concentrations. Thus, the conclusion as presented cannot be supported at this time. Please revise the Work Instructions to indicate that metals, will be evaluated at the BDDT area at the conclusion of the proposed sampling to determine if there are unacceptable risks associated with the contaminants in site media. Also, clarify if in the statement quoted above “Non-PAH SVOCs” was intended, and not separate listings of PAH and SVOCs. In addition, a cursory review of the Site Characterization Work Plan, Addendum 012 (IT Corp., April 2001), seems to indicate that previous sampling at the BDDT did not include pesticides and herbicides as analytes (pages 1-73 to 1-79). Please clarify if this is correct, and if so, revise the Work Instructions to provide an explanation for the omission of pesticides and herbicides as analytes in samples collected or proposed at the BDDT.

RFAAP Response

Metals will be evaluated in the follow up RI report. Samples collected during the 2002 sampling indicate that metals do not appear to be an issue at the BDDT.

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Yes, Non-PAH SVOCs was intended. There should be no comma between “(PAH)” and “semi-volatile”. This statement was meant to indicate that the only SVOCs of concern were PAHs.

Sampling for herbicides/pesticides was conducted as part of WPA 012 and results/discussion will occur in the RI report.

EPA Comment 6

Table 1-2 on page 1-8: presents the proposed sampling and analysis at the Building Debris Disposal Trench (BDDT). The table states that surface and subsurface soil samples will be analyzed for polychlorinated biphenyls (PCB). There is no discussion in the accompanying section stating why PCBs are proposed for analysis. This issue should be clarified.

RFAAP Response

RFAAP has specifically requested that samples collected for laboratory analysis as part of this investigation be analyzed for TCL PCBs in addition to the analytes of concern. This will be clarified in the text and discussed in the RI report.

EPA Comment 7

Section 1.1.3.1, Soil Sampling, on page 1-8: states that initially, 12 samples will be collected from the delta where the ditch enters the stream. The section further states that additional samples will be collected where PAH concentrations exceed the adjusted residential risk based concentration. An additional goal of the sampling should be to characterize the area presenting potential ecological risk. The document should clearly state how this characterization will be performed.

RFAAP Response

Proposed sampling is to better delineate areas of concern. A SLERA will be conducted using the combined data from the previous investigations, the WPA 012 investigation and the data to be collected as part of this follow-on investigation to assess the risks to ecological receptors.

EPA Comment 8

Figure 1-3, Building Debris Disposal Trench Surface Water/Sediment and Proposed Sampling Locations: This Figure depicts the 24 proposed grid-sampling locations. Section 1.1.3.1 indicates that an initial 12 samples will be collected, and the remaining samples will be stepped out from the original locations, based upon the results. Please revise Figure 1-3 to differentiate the initial proposed 12 samples from the final 12 sample locations. Also, discuss why no additional sampling outside of the grid area (e.g., the rip rap area) is not proposed, as the results of the previous sampling indicate constituents that are present at concentrations exceeding various screening criteria including background values.

The legend for Figure 1-3 indicates that the values in the shaded cells exceed either the April 2003 EPA Region 3 Residential Risk-Based Concentrations (RBCs) for soil or the 1999 EPA

National Recommended Water Quality Criteria (NRWQC) (chronic) values. Please revise this figure to clearly indicate which values exceed which screening criteria or list these screening values on the figure. Also, it is not clear why the NRWQC values are being used as screening for water samples, since the RFAAP SSP requires use of the tap water RBCs for screening water samples and maximum contaminant levels (MCLs) for groundwater and surface water used as a source of drinking water. If the use of NRWQC is necessary for some reason, please use the most current version of *NRWQC human health criteria matrix calculation* (November 2002) and revise any conclusions drawn from this comparison as appropriate.

RFAAP Response

In response to this comment and similar comments in Comments 11, 13, and 14, only the 12 initial samples will be presented on the figure. Samples have not been proposed for the rip-rap area because this area has been backfilled with clean fill and covered with geotextile membrane and rip-rap. No exposure pathways are present in this area.

RFAAP will use MCLs for screening (NRWQCs will be part of the SLERA).

To insure the clarity of black and white reproduction, the amount of symbols and shading is limited. The sample IDs, the sample symbols and the units indicate which criteria are being used. RFAAP requests that the use of this format be allowed to continue.

Please see RFAAP Response to Comment #20 regarding terminology revisions.

EPA Comment 9

Table 1-4 states that surface and subsurface soil, sediment and fish tissue will be analyzed for PCBs. Information should be provided stating why PCB analysis is being performed, since the data provided indicates low to non-detect PCBs in most upgradient samples. Because PCBs will bioaccumulate in tissue, even when found at low levels in media, PCB analysis in fish tissue should still be performed, even if additional characterization of soil or sediment may not be warranted.

RFAAP Response

RFAAP has specifically requested that samples collected for laboratory analysis as part of this investigation be analyzed for TCL PCBs in addition to the analytes of concern. This will be clarified in the text.

EPA Comment 10

Section 1.2.2, Summary of Previous Investigations, page 1-11: This section states that “VOCs, non-PAH SVOCs, herbicides, explosive compounds, dioxins/furans, and pesticides were detected, but did not exceed residential screening levels; therefore, these compounds are not a concern at the NBG study area.” A cursory review of the Site Characterization Work Plan, Addendum 012 (IT Corp., April 2001), seems to indicate that previous sampling at the NBG did not include herbicides as an analyte (pages 1-90 to 1-95). Please clarify if this is correct, and if so, revise the Work Instructions to provide an explanation for the omission of herbicides as an analyte in samples collected or proposed at the NBG.

RFAAP Response

Samples were analyzed for herbicides during the field investigation for WPA 012. A full ^{CRITICAL} discussion of results will be presented in the RI report.

EPA Comment 11

Section 1.2.3.1, XRF Screening, page 1-14: This section states that approximately 48 samples will be collected and screened for lead using XRF at the NBG - main area. A review of the historic sampling results for the NBG-main area and the proposed screening locations shown on Figure 1-5 seems to indicate that the depicted sampling locations are the minimum number of samples which will be screened (prior to additional step-out sampling) to determine the NBG-main area extent of lead contamination that is greater than 400 mg/kg in the horizontal plane. It is indicated in the text that initially samples will be collected from 12 locations, but the step-out process is not explained and the locations of these samples are not identified. Please clarify if the screening locations shown on Figure 1-5 are the minimum number of samples to be screened, or revise the Work Instructions to provide a more detailed methodology for the proposed XRF screening process and include a figure containing the minimum number of proposed screening sampling locations. In addition, Figure 1-5 shows 49 anticipated XRF screening locations, instead of 48. Please clarify which is correct and revise the Work Instructions accordingly.

The 49 screening locations depicted on Figure 1-5 cover less than half of the 30 feet (ft) by 42 ft grid area. The area not covered by the screening sampling have not been investigated previously, however, a sample (NBGSD01) located outside of the grid area (north of the Guard Road, near the culvert) indicated constituents exceeding residential RBCs and background values. Please discuss why no samples are proposed between this sampling location and mid-grid location or revise the Work Instructions to propose random sampling locations within the area identified.

RFAAP Response

Forty-eight is the approximate total number of XRF samples anticipated to be collected. As in response to Comment #8, only the initial sample locations will be shown on the figures. The final number of samples required to complete delineation will be determined during the field investigation. SOP 30.7 of the Master Work Plan (MWP) is referenced and discusses grid sampling. The location of step out samples cannot be known until results of the initial samples are processed.

Based on investigations conducted prior to WPA 012, there is no indication that burn activities were conducted in this area. The grid was extended to this area in order to collect samples to verify that burn activities did not occur in this area. Sampling will move from the main burn area in the direction of sample NBGSD01 depending on the results of the XRF screening. The Work Instructions also include two additional samples to be collected from the ditch on the near side of the road to assess this area (Section 1.2.3.3).

EPA Comment 12

Section 1.2.3.2, Soil Sampling, page 1-14: This section states that nine confirmation samples and 12 soil samples from three borings will be collected after the x-ray fluorescence (XRF) screening for lead is completed at the NBG - main area. Table 1-3 indicates that 12 surface soil confirmation samples and 9 soil boring samples will be collected. Even though the total number of samples is constant, Table 1-3 seems to indicate that the surface soil samples collected at the

three boring locations will also serve as confirmation samples. Please clarify if this is correct and revise the Work Instructions accordingly.

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RFAAP Response

There are 12 surface soil samples proposed. Nine of these samples are confirmation samples from the XRF survey. There are nine subsurface soil and three surface soil samples proposed from the three soil borings. In order to reduce confusion, the "confirmation" will be removed from Table 1-3 in the surface soil subheading.

EPA Comment 13

Figure 1-5, Northern Burning Ground Main Burning Area Proposed Sampling Locations and Results: This Figure shows the proposed location of seven perimeter confirmation sample locations. Since the confirmation sample locations will be chosen at the conclusion of the XRF screening using the procedure discussed in Section 1.2.3.2, showing proposed locations on Figure 1-5 is inappropriate. Please revise Figure 1-5 to remove the proposed confirmation sampling locations.

The legend for this figure indicates that values in the shaded cells exceed either the industrial soil RBC values or the EPA toxicity characteristics leaching procedure (TCLP) criteria. The TCLP comparison of the data does not add any value to the screening process, especially when its exceedance cannot be discriminated from RBC exceedance. Please revise this figure to remove the TCLP comparison and present this comparison in a separate table.

RFAAP Response

Sample locations will be determined in the field based on results from the XRF survey. The maps are intended to give an approximate idea of the number and location of samples. For clarity, confirmation sample locations will be removed from the figures. All available lead data was presented in order to provide a complete sampling picture. TCLP data was not intended and will not be used for screening or contamination assessments. TCLP screening adds qualitative data that can aid in addressing data needs.

EPA Comment 14

Section 1.3.3.1, XRF Screening, pages 1-21 to 1-24: This section states that approximately 50 samples will be collected and screened for lead using XRF at the WBG. A review of the historic sampling results for the WBG and the proposed screening locations shown on Figure 1-7 seems to indicate that the depicted sampling locations are the minimum number of samples which will be screened (prior to additional step-out sampling) to determine the WBG extent of lead contamination that is greater than 400 mg/kg in the horizontal plane. Please clarify if this is correct, or revise the Work Instructions to provide a more detailed methodology for the proposed XRF screening process and include a figure containing the minimum number of proposed screening sampling locations.

RFAAP Response

Fifty samples is an estimation of the number of samples that will be required to delineate areas of elevated constituents. Samples shown on the Figure 1-7 are intended to present the likely locations where these samples will be collected. However, as previously discussed, only the initial sampling locations will be presented in the figures. XRF results

from the initial samples (closest to identified hotspots) will be used to determine subsequent locations.

Original

EPA Comment 15

Section 1.3.3.1, XRF Screening, on page 1-21 states that surface soil samples for x-ray fluorescence (XRF) screening will be collected from a square grid pattern with an 18 foot spacing between grid line intersections. Justification should be provided for this sampling approach. Collecting samples in a grid is acceptable where no preferential flow path is expected. Where preferential flow paths are present, grid sampling can overlook these pathways. If preferential flow paths to the pond and/or depositional areas are present, these areas should be sampled, regardless of where they fall on the grid.

RFAAP Response

The grid is intended to provide a starting point for the locations of samples and is discussed in SOP 30.7 of the MWP. Text will be clarified to indicate that samples will be biased towards drainage pathways (and other indications of contamination, if noted).

EPA Comment 16**Figure 1-7, Western Burning Ground Main Soil Boring and Proposed Sampling Locations:**

This figure depicts 14 of 15 samples collected along the dirt road (location of cross section A - A') as confirmation samples. Section 1.3.3.1 describes all 15 sample locations as soil borings. Please clarify which is correct and revise the Work Instructions accordingly. In addition, Figure 1-7 depicts 5 samples collected in the unnamed pond as soil borings. Section 1.3.3.1 did not describe any sediment borings to be placed within the unnamed pond. Please address these discrepancies and revise the Work Instructions accordingly. In addition, discuss why no additional sampling outside of the grid area (e.g., along the unlined drainage ditch and the bermed area) are not proposed, as the results of the previous sampling indicate constituents that are present at concentrations exceeding various screening criteria including background values.

RFAAP Response

The symbols for the confirmation sediment samples and the soil borings are switched in the legend. In addition, the fifteenth sample near the unpaved road is also a boring. The figure will be corrected. Data analysis from WPA 12 indicated that no additional sampling was necessary in the bermed area. Additional sampling in the unlined ditch is discussed in comment No. 17.

EPA Comment 17

Figure 1-7 presents the proposed sampling locations for the Western Burning Ground (WBG). The figure shows elevated metals in the unlined drainage ditch northwest of the WBG (Sample WBGsBB25A). Because the goal of this work plan is to characterize migration pathways to the unnamed pond, additional samples in the ditch and pond downgradient of this sample should be collected.

RFAAP Response

Three additional surface soil samples will be collected in the unlined drainage ditch. One sample will be collected upgradient of sample WBGsBB25 and the WBG. Two soil samples will be collected between sample WBGsBB25 and the unnamed pond. A sediment sample will be collected from the unnamed pond at the confluence of the ditch and the pond. Samples will be analyzed for metals and PAHs.

EPA Comment 18

Section 1.3.3.3, Fish Tissue/Bioaccumulation Study, on page 1-24 states that fish samples^{ORIGINAL} (fillets) will be collected from the WBG pond and analyzed to further evaluate the potential for adverse effects to humans from the consumption of fish associated with the pond. A similar statement appears on page 1-25, stating that potential risks from the consumption of fish will be evaluated for child and adult fishers. This is inconsistent with the statement on pages 1-18 and 1-19 that the tissue sampling is being performed to assess aquatic organism health. BTAG recommends that fish tissue be used to assess risk to fish populations using critical body residues and to piscivorous birds and mammals using food chain modeling. Because piscivorous birds and mammals eat whole fish and not fillets, whole body fish should be analyzed.

RFAAP Response

Regulators from the Commonwealth of Virginia have made this comment as well. Whole body fish will also be analyzed.

EPA Comment 19

Section 1.3.3.3, Fish Tissue/Bioaccumulation Study, on page 1-25: states that an analysis consistent with EPA guidance was conducted to assess the sample size required to provide sufficient power to detect the difference between tissue concentrations and screening values. Based on this analysis, 14 water column fish (largemouth bass) and 14 bottom dwelling fish (brown bullhead) should be collected from the pond. The section states that because this quantity is likely to significantly impact the remaining population of fish in the pond, seven of each species will be collected. No information is presented to support that collecting 14 of each species would impact the remaining population. It is unlikely that collecting this many fish from a pond with a healthy fish population would have a significant impact on fish populations in the pond. Therefore, EPA BTAG recommends that 14 fish of each species be collected as determined by EPA guidance.

RFAAP Response

Fourteen fish from each species will be collected, in accordance with EPA guidance.

Minor Comments

EPA Comment 20

The Work Instructions seem to change from single sided pages to double sided pages, although the page numbering does seem to include all pages, even those that are blank and inserted figures (which contain no page numbers). This method of page numbering makes it difficult follow and/or reference the Work Instructions, and leaves the reviewer to believe that pages are missing from the document. In future revisions of the Work Instructions, please maintain a consistent page numbering system with either single or double sided pages.

RFAAP Response

In order to reduce the number of single sided pages within the report, the oversized figures in map pockets will be moved to the rear of the report and called "Exhibits" rather than "Figures". The term "Figures" will be used to refer to 8½" x 11" figures within the body of the report.

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Response to VDEQ Comments dated 25 March 2004
for
Draft NRU Additional Characterization Sampling Work Plan
Dated November 2003

VDEQ Comment 1

Page 1-8 & Figure 1-3: as illustrated in Figure 1-3, there is a distance of approximately 90 feet of the BDDT that will not be sampled. The last sample collected from the trench, DTSB45, recorded a benzo(a) pyrene level of 1300 ug/kg, which exceeds the industrial screening level. It would be beneficial to collect a sample in the 90 foot stretch of trench that has not been investigated. Rather than collected a sample from the outlying area, please add one surface soil sample between DTSB45 and the first proposed sample collection point.

RFAAP Response

Samples will be collected in the 90 foot stretch of trench that has not been investigated. The final number of samples will be determined by the results of initial samples. Figure 1-3 has been revised to show the sampling grid extending to the last soil sample collected in the trench (DTSB45). The figure has also been revised to present the locations of only the 12 initial samples. The text has been revised to clarify that samples will be collected in the trench area as guided by initial sample results.

VDEQ Comment 2

Section 1.1.3, page 1-18: this section state that “the results of previous investigation are shown on Figure1-6.” However, WPA 12 Figure 1.13-1 indicates that surface water and sediment samples were to be collected in and around the unnamed creek and Wiggins Spring: WBGSW08, WBGSD08, WBGSW09, WBGSD09, WBGSW13, WBGSD13 & 14 respectively. If these samples did not have any detections, please reference this in the report. If there were detections, please illustrate them in Figure 1-6. Furthermore, please illustrate the area from which the perchlorate sample was collected.

RFAAP Response

An additional exhibit (Exhibit 7) has been added to the Work Instructions showing exceedances at the requested sample locations and proposed surface water sampling locations to confirm the perchlorate detection at sample location WBGSW14.

VDEQ Comment 3

Section 1.1.3, page 1-18: this section states that samples will be collected to identify any ecological adverse effects on organisms inhabiting the unnamed pond and assess aquatic organism health. Section 1.3.3.3 states that fish fillets will be used for a bioaccumulation study. Although using fillets can be applied to adverse effects through human consumption, in order to assess aquatic organism health whole fish samples must be used.

RFAAP Response

The text has been revised to include whole fish analysis as well as fish fillets.